



## PLTW Engineering

# 10-12/Career Exploration – Line Installers and Repairers

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10-12/DE

Lesson: **5/8/2020**

**Objective/Learning Target: Students will be able to explain the career path of a line installer and repairer**



## What do line installers do?

Line installers and repairers, also known as *line workers*, install or repair electrical power systems and telecommunications cables, including fiber optics.

While some installers work with both electrical power lines and telecommunications lines, they are usually separate and specific career paths.



## What do line installers do?

Electrical power-line installers and repairers install and maintain the power grid—the network of power lines that moves electricity from generating plants to customers. They routinely work with high-voltage electricity, which requires extreme caution. The electrical current can range from hundreds of thousands of volts for long-distance transmission lines that make up the power grid to less than 10,000 volts for distribution lines that supply electricity to homes and businesses.



## What do line installers do?

Telecommunications line installers and repairers install and maintain the lines and cables used by network communications companies. Depending on the service provided—local and long-distance telephone, cable television, or Internet—telecommunications companies use different types of cables, including fiber optic cables. Unlike metallic cables that carry electricity, fiber optic cables are made of glass and transmit signals using light. Working with fiber optics requires special skills, such as the ability to splice and terminate optical cables. In addition, workers use specialized equipment to test and troubleshoot cables and networking equipment.



## Typical duties of line installers

Electrical power-line installers and repairers typically do the following:

- Install, maintain, or repair the power lines that move electricity
- Identify defective devices, voltage regulators, transformers, and switches
- Inspect and test power lines and auxiliary equipment
- String power lines between poles, towers, and buildings
- Climb poles and transmission towers and use truck-mounted buckets to get to equipment
- Operate power equipment when installing and repairing poles, towers, and lines
- Drive work vehicles to job sites
- Follow safety standards and procedures



## Typical duties of line installers

Telecommunications line installers and repairers typically do the following:

- Install, maintain, or repair telecommunications equipment
- Inspect or test lines or cables
- Lay underground cable, including fiber optic lines, directly in trenches
- Pull cables in underground conduit
- Install aerial cables, including over lakes or across rivers
- Operate power equipment when installing and repairing poles, towers, and lines
- Drive work vehicles to job sites
- Set up service for customers



## Line installers vs line repairers

Line installers install new cable. They may work for construction contractors, utilities, or telecommunications companies. Workers generally start a new job by digging underground trenches or erecting utility poles and towers to carry the wires and cables. They use a variety of construction equipment, including digger derricks, which are trucks equipped with augers and cranes used to dig holes and set poles in place. Line installers also use trenchers, cable plows, and directional bore machines, which are used to cut openings in the earth to lay underground cables. Once the poles, towers, tunnels, or trenches are ready, workers install the new cable.





## Line installers vs line repairers

Line repairers are employed by utilities and telecommunications companies that maintain existing power and telecommunications lines. Maintenance needs may be identified in a variety of ways, including remote monitoring, aerial inspections, and by customer reports of service outages. Line repairers often must replace aging or outdated equipment, so many of these workers have installation duties in addition to their repair duties. When a problem is reported, line repairers must identify the cause and fix it. To work on poles, line installers usually use bucket trucks to raise themselves to the top of the structure, although all line workers must be adept at climbing poles and towers when necessary. Workers use special safety equipment to keep them from falling when climbing utility poles and towers.



## Line installer work environment

The work of line installers and repairers can be physically demanding. Line installers must be comfortable working at great heights and in confined spaces. Despite the help of bucket trucks, all line workers must be able to climb utility poles and transmission towers and balance while working on them. Their work often requires that they drive utility vehicles, travel long distances, and work outdoors. Line installers and repairers often must work under challenging weather conditions, such as in snow, wind, rain, and extreme heat and cold.



## Line installer work environment

Line workers encounter serious hazards on their jobs and must follow safety procedures to minimize danger.

For example, workers must wear safety equipment when entering underground manholes and test for the presence of gas before going underground.



## Line installer work environment

Electrical power-line installers and repairers can be electrocuted if they come in contact with a live cable on a high-voltage power line.

When workers engage live wires, they use electrically insulated protective devices and tools to minimize their risk.



## Line installer work environment

To prevent injuries, line installers and repairers use fall-protection equipment when working on poles or towers.

Safety procedures and training have significantly reduced the danger for line workers.

However, telecommunications line installers and repairers still have one of the highest rates of injuries and illnesses of all occupations.



## How to become a line installer

Most companies require line installers and repairers to have a high school diploma or equivalent.

Employers prefer candidates with basic knowledge of algebra and trigonometry.

In addition, technical knowledge of electricity or electronics obtained through military service, vocational programs, or community colleges can also be helpful.



## Important qualities for a line installer

**Color vision.** Workers who handle electrical wires and cables must distinguish colors because the wires and cables are often color coded.

**Mechanical skills.** Line installers and repairers must have the knowledge and skills to repair or replace complex electrical and telecommunications lines and equipment.

**Physical stamina.** Line installers and repairers often must climb poles and work at great heights with heavy tools and equipment. Therefore, installers and repairers need to work for long periods without tiring easily.



## Important qualities for a line installer

**Physical strength.** Line installers and repairers must be strong enough to lift heavy tools, cables, and equipment on a regular basis.

**Teamwork.** Because workers often rely on their fellow crew members for their safety, teamwork is critical.

**Technical skills.** Line installers use sophisticated diagnostic equipment on circuit breakers, switches, and transformers.

They must be familiar with electrical systems and the appropriate tools needed to fix and maintain them.





## How much do line installers make?

The median annual wage for electrical power-line installers and repairers was \$72,520 in May 2019.

The lowest 10 percent earned less than \$38,810, and the highest 10 percent earned more than \$103,500.

The median annual wage for telecommunications line installers and repairers was \$56,750 in May 2019.

The lowest 10 percent earned less than \$32,590, and the highest 10 percent earned more than \$94,880.



## Quiz yourself

1. Name 2 different types of lines that line installers can install or repair.
2. How are signals transferred through fiber-optic cable?
3. List 2 duties associated with electrical line installers.
4. List 2 duties associated with telecommunications line installers.
5. What is the minimum education requirement to become a line installer?
6. Would you consider this career to be risky or hazardous to your health?



## Helpful links

[Comparing electrical lineman vs electrician](#)

[Evergy energy supplies energy to Kansas City](#)

[Wichita Lineman by Glen Campbell](#)